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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/510,602	05/13/2005	Jong-Po Jeon	8947-000116/US	1786

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EXAMINER

KORNAKOV, MICHAIL

ART UNIT PAPER NUMBER

1746

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/510,602

Applicant(s)

JEON ET AL.

Examiner

Mikhail Kornakov

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 21 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicants' amendment dated 06/21/2006 has overcome objections to drawings and specification and the rejection of claims 1-9 under 35 USC 112, second paragraph and the objections and rejection are withdrawn. Claim 1 is amended to indicate a baking pressure at 760 Torr. Claims 1-9 are currently pending and examined on the merits.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishina et al (U.S. 5,503,964) in view of JP10-189541.

Nishina teaches a method of removing photoresist from semiconductor wafer made of silicone. The method of Nishina comprises a baking step wherein the wafer with photoresist is baked under the ambient pressure followed by ashing step wherein the wafer with photoresist is vacuumized and exposed to oxygen plasma under 2 to 5 Torr pressure. The baking temperature ranges from 120°C to below about 300°C (Abstract; col.3, lines 46-49; col. 4, lines 11-44; col. 6, lines 8-53). With regard to the recitation of claim 1, stating "substrate having hard to soft photoresist layers", since Nishina teaches applying to the substrate resist composed of positive type novolak materials with subsequent hardening process, the presence of hard and soft areas within such resist is reasonably expected.

Nishina does not explicitly teach placing a wafer on a hot plate. However, hot plates are conventionally utilized in the art for heating substrates. Thus, JP'541 teaches a similar method of removing photoresist, wherein the substrate is brought in contact with plate (18) having a heater for raising substrate temperature. Therefore, one skilled in the art would have found obvious to utilize a conventional plate in order to raise and maintain appropriate temperature while baking the substrate in the teaching of Nishina.

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6. Claims 7, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishina et al (U.S. 5,503,964) in view of JP10-189541 and in further view of Wang et al (U.S. 6,409,932).

The teaching of Nishina/JP'541 does not specifically indicate that the photoresist is ashed from a via etched or a pad etched wafer. Wang teaches a similar photoresist removing process and indicates that the principles and advantages of his disclosure can be applied to a number of low pressure treatments. Therefore, one skilled in the art motivated by Wang would have found obvious to utilize the teaching of Nishina/JP'541 while removing photoresist from via etched or pad etched wafers with the reasonable expectation of success.

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishina et al (U.S. 5,503,964) in view of JP10-189541 and in further view of Mohondro et al (U.S. 6,406,836).

The teaching of Nishina/JP'541 remains silent about an overashing step. However, the overashing is conventionally utilized in the art in order to assure complete removal of photoresist and the other residual materials from wafer surfaces. Thus, Mohondro teaches that in order to remove residual material left after photoresist ashing, the ashing step is followed by an overash step, utilizing the plasma previously generated at ashing, thus removing all polymeric materials from the semiconductor structure (col. 3, lines 35-40). Therefore, one skilled in the art motivated by Mohondro would have found obvious to proceed with overashing upon ashing in order to assure

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complete removal of photoresist and other polymeric residues while treating the wafer as per teaching of Nishina/JP'541.

### ***Conclusion***

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

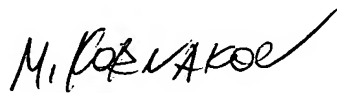
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mikhail Kornakov whose telephone number is (571) 272-1303. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Mikhail Kornakov  
Primary Examiner  
Art Unit 1746

09/15/2006